WHAT IS CLAIMED IS:

	1	<i>∴</i> 1.	A thicrofluidic device comprising:
	2	(a)	a first elastic layer;
S.	3	(b)	a fluid flow channel within said elastic layer; and
	4	(c)	a means for providing a sample of fluid from said fluid flow
$\bigcap II$	5	channel to an analytic	al device.
	1	2.	The microfluidic device of Claim 1, wherein the width of said fluid
	2	flow channel is about	$500 \ \mu m$ or less.
	1	3.	The microfluidic device of Claim 1, wherein said sample providing
	2	means comprises a ca	pillary at least a portion of which is located within said fluid flow
	3	channel.	
	1	4.	The microfluidic device of Claim 3, wherein said capillary forms a
	2	hermetic seal with sai	d flow channel.
	1	5.	The microfluidic device of Claim 3, wherein said capillary further
Ŀ	2	comprises a sample in	nterface operatively interconnected to an analytical device for
	3	introducing a fluid sar	mple from said fluid flow channel into said analytical device for
	4	analysis.	
	1	6.	The microfluidic device of Claim 5, wherein said analytical device
	2	is a selected from the	group consisting of UV spectrometers, fluorescence spectrometers,
	3	IR spectrometers, gas	chromatographic devices, liquid chromatographic devices, NMR
	4	devices, mass spectro	meters and combinations thereof.
	1	7.	The microfluidic device of Claim 6, wherein said sample interface
	2	means comprises a m	eans for generating a mist from the fluid flowing through said
	3	capillary, whereby sa	id mist is introduced said analytical device for analysis.
	1	8.	The microfluidic device of Claim 7, wherein said analytical device
	2	is a mass spectromete	т.

1	9. The microfluidic device of Claim 8, wherein said means for
2	generating a mist comprises a device for applying electrospray voltage to said capillary to
3	generate said mist.
1	10. The microfluidic device of Claim 9, wherein the tip of said
2	capillary comprising said sample interface means is tapered.
1	11. The microfluidic device of Claim 5, wherein said microfluidic
2	device further comprises a second elastic layer on top of said first elastic layer.
1	12. The microfluidic device of Claim 11, wherein said second elastic
2	layer comprises a pressure channel.
1	13. The microfluidic device of Claim 12, wherein said microfluidic
2	device further comprises a pump and valve system within said second elastic layer for
3	controlling the flow of fluid within said fluid flow channel.
1	14. The microfluidic device of Claim 13, wherein said sample interface
2	means comprises generating a mist using said pump system.
1	15. The microfluidic device of Claim 13 further comprising a sample
2	preparation chamber within said fluid flow channel.
1	16. The microfluidic device of Claim 15, wherein said sample
2	preparation chamber comprises a rotary fluid flow channel and a means for circulating a
3	fluid within said rotary fluid flow channel for conducting a chemical reaction, an assay, o
4	other sample preparations within said rotary fluid flow channel.
1	17. The microfluidic device of Claim 16, wherein said mean for
2	circulating the fluid within said rotary fluid flow channel comprises said pump and valve
3	system.
1	An analytical apparatus for analyzing a fluid sample comprising:
2	(a) an analytical device for analyzing the fluid sample; and
3	(b) a microfluidic device operatively interconnected to said analytical
4	device, wherein said microfluidic device comprises a first elastic layer comprising a fluid

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- flow channel and a means for introducing the fluid sample into said analytical device from said fluid flow channel.
- 1 19. The analytical apparatus of Claim 18, wherein said analytical device is selected from the group consisting of UV spectrometers, fluorescence spectrometers, IR spectrometers, gas chromatography devices, LPLC devices, HPLC devices, NMR devices, mass spectrometers and combinations thereof.
- 1 20. The analytical apparatus of Claim 19, wherein said analytical device is an electrospray ionization mass spectrometer or a nanoelectrospray mass spectrometer.
- 1 21. The analytical apparatus of Claim 20, wherein said fluid sample 2 introducing means comprises a means for generating an ionized mist from the fluid 3 sample.
 - 22. The analytical apparatus of Claim 21, wherein said ionized mist generating means comprises a capillary having a distal end and a proximal end, wherein said proximal end of capillary is located within said fluid flow channel, and said distal end of capillary is interconnected to a device for applying electrospray voltage for generating the mist.
- 1 23. The analytical apparatus of Claim 22, wherein the bore diameter of 2 said distal end of capillary is about 100 μm or less.
- 1 24. The analytical apparatus of Claim 22, wherein said distal end of 2 capillary is tapered.
- 1 25. The analytical apparatus of Claim 18, wherein said microfluidic 2 device further comprises a second elastic layer on top of said first elastic layer.
- 1 26. The analytical apparatus of Claim 25, wherein said second elastic 2 layer comprises a pressure channel for controlling the flow of fluid through said fluid 3 flow channel.

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1	27.	The analytical apparatus of Claim 26, wherein said microfluidic
2	device further com	prises a pump and valve system within said second elastic layer for
3	controlling the flow	of fluid within said fluid flow channel.
1	28.	The application appropriate of Claim 27 footbox commissions a commis
1		The analytical apparatus of Claim 27 further comprising a sample
2	preparation chambe	er within said fluid flow channel.
1	29.	The analytical apparatus of Claim 28, wherein said sample
2	preparation chambe	er comprises a rotary fluid flow channel and a means for circulating a
3	fluid within said ro	tary fluid flow channel for conducting a chemical reaction, an assay, or
4	other sample prepa	rations within said rotary fluid flow channel.
1	30.	The microfluidic device of Claim 29, wherein said mean for
2		I within said rotary fluid flow channel comprises said pump and valve
3	system.	within said folding flate flow endinion comprises said pump and varve
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1	<i>3</i> 1.	A method for producing a microfluidic device comprising a means
2	for introducing a fl	uid sample into an analytical device, said method comprising the steps
3	of:	
4	- (a)	producing a first elastic layer of said microfluidic device, wherein
5	said first elastic lay	er comprises a fluid flow channel; and
6	(b)	integrating a proximal end of a capillary within said fluid flow
7 .	channel,	
8	wherein a distal end	d of said capillary comprises said sample introducing means.
1	32.	The method of Claim 31, wherein said step of integrating the
2	capillary comprises	s the steps of:
3	(a)	producing a bottom portion of first elastic layer comprising a
4	bottom portion of s	aid fluid flow channel and a top portion of first elastic layer
5	comprising a top po	ortion of said fluid flow channel; and
6	(b)	placing said proximal end of capillary in said bottom portion of
7	said fluid flow char	annel on said bottom portion of first elastic layer and placing said top
8		tic layer on top of said first portion of first elastic layer and forming a
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seal between said bottom and said top portions of first elastic layer to provide said first

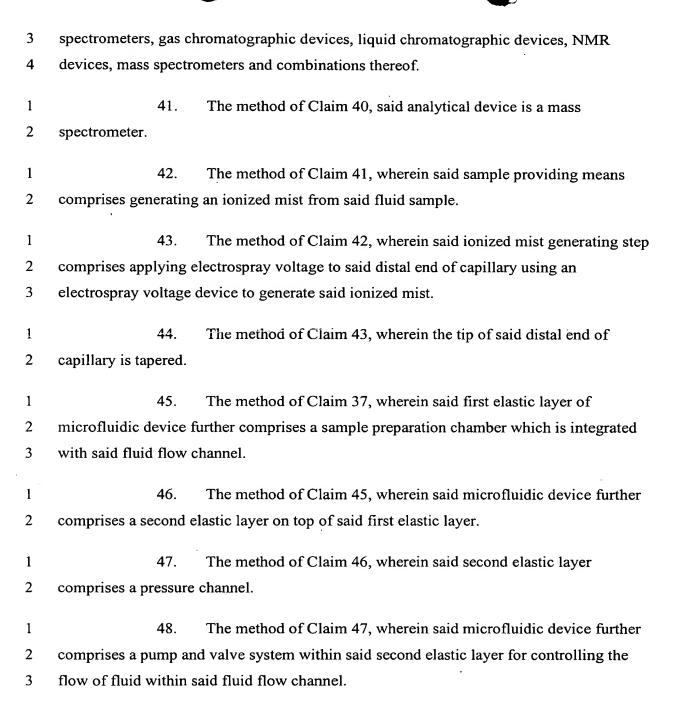
elastic layer comprising said fluid flow channel.

1	33.	The method of Claim 32, wherein said first elastic layer is
2	produced by a mixture	e of two polymer components.
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1	34.	The method of Claim 33, wherein said bottom portion comprises
2	- ·	mer component and said top portion comprises an excess of the
3	other polymer compo	nent.
1	35.	The method of Claim 31, wherein said distal end of capillary is
2	interconnected to a de	vice for applying electrospray voltage for generating a mist for
3	introducing the fluid s	sample into an electrospray ionization mass spectrometer or a
4	nanoelectrospray mas	s spectrometer.
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1	36.	The method of Claim 35, wherein said distal end of capillary is
2	tapered.	
1	37.	A method for analyzing a fluid sample using an analytical device
2	comprising the steps of	
3	(a)	introducing said fluid sample into said analytical device through a
4	fluid flow channel of	a microfluidic device, wherein said fluid flow channel is located
5	within a first elastic layer of said microfluidic device; and	
6	(b)	analyzing said fluid sample using said analytical device.
1	38.	The method of Claim 37, wherein said microfluidic device further
2		roviding means interconnected to said fluid flow channel and a
3		
4	sample injection site of said analytical device for introducing said fluid sample into said analytical device from said fluid flow channel.	
7	analytical device from	said fiuld flow chamer.
1	39.	The method of Claim 38, wherein said sample providing means
2	comprises a capillary	wherein a proximal end of said capillary is integrated with said fluid
3	flow channel and the	distal end of said capillary is operatively interconnected to said
4	analytical device such	that said fluid sample from said fluid flow channel is introduced
5	into said sample inject	tion site through said distal end of capillary.
1	40	The mosthed of Claims 20, subsquire and 1 and 10 at 1 at 1
1	40.	The method of Claim 39, wherein said analytical device is a
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- 49. The method of Claim 48, wherein said sample preparation chamber comprises a rotary fluid flow channel and a means for circulating a fluid within said rotary fluid flow channel.
- 1 50. The method of Claim 49, wherein said mean for circulating the 2 fluid within said rotary fluid flow channel comprises said pump and valve system.

1		51.	The method of Claim 50 further comprising the steps of preparing
2	said fluid sam	ple with	nin said sample preparation chamber.
1		52.	The method of Claim 45, wherein said sample preparation step
2	comprises con	ducting	g a sample preparation process within said sample preparation
3	chamber, whe	rein sai	d sample preparation process comprises:
4	•	(i)	conducting a chemical reaction;
5		(ii)	conducting an assay;
6		(iii)	degrading a peptide or protein;
7		(iv)	conducting a chemical analysis;
8		(v)	extraction of analytes from solvents;
9		(vi)	extraction of analytes from bodily fluids;
10		(vii)	concentration of sample analytes;
11		(viii)	affinity purification of an analyte;
12		(ix)	digesting a nucleic acid, carbohydrate, lipid or other molecule or
13	mixture of mo	lecules	•
14		(x)	separation; and
15		(xi)	cell growth (mammalian, bacterial or parasite).
1		53.	The method of Claim 52, wherein said sample preparation step
2	comprises con	ducting	g a combinatorial chemistry for preparation of an array of polymers
3	from a monon	ner.	
1		54.	The method of Claim 53, wherein said monomer is selected from
2	the group cons	sisting o	of nucleotides, amino acid peptides, carbohydrates, lipids, and
3	precursors for	combin	natorial synthesis.
1		55.	The method of Claim 52, wherein said sample preparation step
2	comprises con	ducting	g a receptor or an enzyme binding assay.
1		56.	The method of Claim 52, wherein said sample preparation step
2	comprises con	ducting	g binding of a target molecule to an array of oligonucleotides,
3	peptides, proteins, oligosaccharides, and small molecules.		

1	57.	The method of Claim 52, wherein said sample preparation step
2	comprises conducting	g an enzymatic degradation of proteins, peptides, oligonucleotides
3	carbohydrates, lipids,	small molecules, or mixtures thereof.

- 1 58. The method of Claim 45, wherein said microfluidic device 2 comprises a plurality of sample preparation chamber.
- 1 59. The method of Claim 58, wherein each fluid sample from said 2 plurality of sample preparation chamber is independently analyzed by said analytical 3 device.